

ABSTRACT

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SURGICAL DEVICE AND METHOD OF USE

A medical device having a working surface of a photonic lattice for controlled diffraction of electromagnetic energy within, and energy emissions from, the working surface to control energy delivery to tissue.

15 The working surface can apply energy to tissue at high or low intensities for thermal therapies, ablations or volumetric removal of tissue volumes. In one embodiment, the energy emitting surface comprises a lattice of a refractory material with interior spatial regions of a selected geometry to provide a band gap. The energy modes confined within the lattice can create a high intensity conditioned plasma for delivering energy to tissue positioned proximate to the lattice. In an exemplary embodiment, the photonic lattice defines a lattice constant of less than

20 about 5 microns for altering a non-preferred energy mode to a preferred mode to control infrared emissions from the working surface. Additional Rf energy can be coupled to the conditioned plasma for enhanced application of energy to tissue.